Small Business Innovation Research/Small Business Tech Transfer

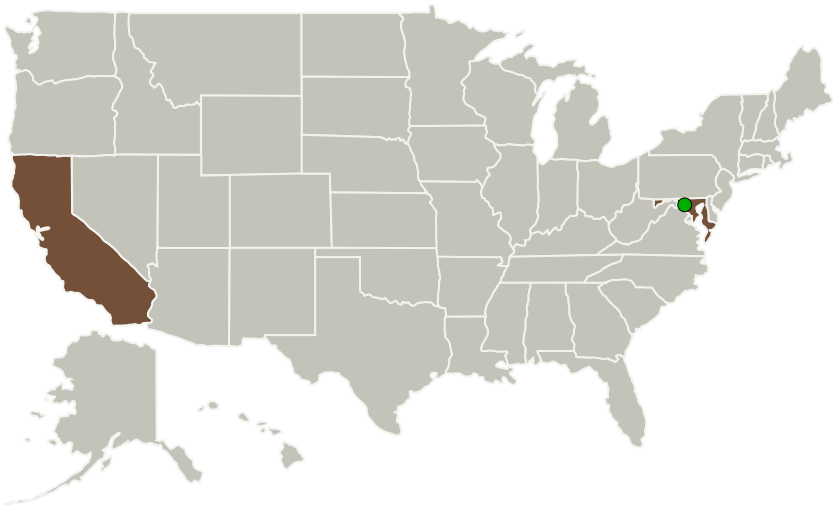
High Performance 3D Photonic Integration for Space Applications, Phase I

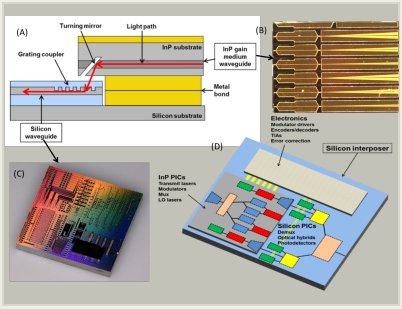
Completed Technology Project (2017 - 2018)

Project Introduction

In this work, Freedom Photonics will team with University of California, Santa Barbara to develop a hybrid integration platform that integrates yielded, best-of-breed active optical components with low-cost, high functionality Silicon Photonics components in a manner that is compatible with foundry fabrication. This will be performed in a highly manufacturable manner, using passively aligned pick-and-place technology to place the semiconductor components on the interposer substrate to form a system in package-type of integration platform for space photonic applications. The approach is based on a novel 3D hybrid integration approach developed at UCSB that is scalable, low cost, reliable, and that demonstrates superior thermal performance.

Primary U.S. Work Locations and Key Partners





High Performance 3D Photonic Integration for Space Applications, Phase I Briefing Chart Image

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Organizations Performing Work	Role	Type	Location
Freedom Photonics, LLC	Lead Organization	Industry	Santa Barbara, California
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland
University of California-Santa Barbara(UCSB)	Supporting Organization	Academia Asian American Native American Pacific Islander (AANAPISI), Hispanic Serving Institutions (HSI)	Santa Barbara, California

Primary U.S. Work Locations	
California	Maryland

Project Transitions

June 2017: Project Start

June 2018: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140865)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Freedom Photonics, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

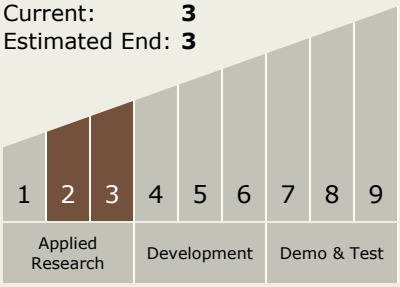
Carlos Torrez

Principal Investigator:

Leif Johansson

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



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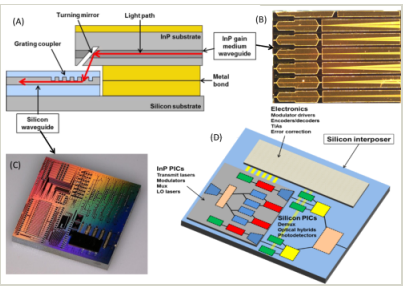
Images



Briefing Chart Image
High Performance 3D Photonic Integration for Space Applications, Phase I Briefing Chart Image *(https://techport.nasa.gov/image/134143)*

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.5 Lasers

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System